



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/663,964	09/19/2000	William R. Babbitt	5922-56160	5387

7590 04/12/2004

JAMES Y. GO, ESQ.  
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP  
12400 WILSHIRE BOULEVARD  
SEVENTH FLOOR  
LOS ANGELES, CA 90025-8600

EXAMINER

JUBA JR, JOHN

ART UNIT PAPER NUMBER

2872

DATE MAILED: 04/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/663,964

**Applicant(s)**

BABBITT ET AL.

**Examiner**

John Juba, Jr.

**Art Unit**

2872

Am

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2004 and 19 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 44 and 56-70 is/are pending in the application.
- 4a) Of the above claim(s) 58, 65 and 69 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 44 is/are allowed.
- 6) ☒ Claim(s) 56, 57, 59-64, 66, 67 and 70 is/are rejected.
- 7) ☒ Claim(s) 68 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on January 20, 2004 and March 19, 2004 have been entered.

### ***Election/Restrictions***

Newly submitted claims 58, 65, and 69 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

claims 58, 65, and 69 are directed to an active material which is frequency selective;

claims 59, 66, and 70 are directed to an active material which is non-frequency selective.

Thus, the two groups of claims are directed to mutually exclusive species of active materials. Upon Applicants' initial filing, all of the claims directed to frequency selective materials were canceled, and only claims directed to non-frequency selective materials were present throughout the prosecution.

Art Unit: 2872

Since applicant has received an action on the merits for the originally presented species, this species has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 58, 65, and 69 are withdrawn from consideration as being directed to a non-elected species of invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Claim Objections***

Claims 67 – 70 are objected to for the following informality. Appropriate correction is required:

In claim 67, last line, there is no antecedent basis for “the second programming pulse”. For the purposes of examination, this passage has been construed as referring to the direction programming pulse, or equivalently (in the present context), to the second angular direction.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 56, 57, 59 – 64, 66, 67, and 70 are rejected under 35 U.S.C. 102(b) as being anticipated by Weiner, et al (*IEEE J. Quantum Elec.* 28(10)). In the interest of brevity, the discussion of basic operation and nomenclature included in the §102(b) rejection of October 17, 2003 is incorporated by reference, rather than repeated here.

Art Unit: 2872

Beginning with method claims 67 and 70, and referring *initially* to the first whole paragraph on Page 2252 ("Our spectral holography setup . . ."), Weiner, et al disclose the steps of

providing the recited active material (thermoplastic plate); and

programming the active material with an optical interference grating providing a spatial-spectral structure corresponding to an interference of an "address" programming pulse ("signal beam") and a "direction" programming pulse ("reference beam"), the address programming pulse comprising a first temporal address waveform propagating along a first angular direction ( $k_s$ ) and the direction programming pulse propagating along a second angular direction ( $k_r$ ) different from the first angular direction.

Turning *for example* to the last paragraph on the left hand side of Page 2253 ("For read out we reused . . .") Weiner, et al further disclose the step of

directing an optical beam ("test beam") to impinge upon the optical interference grating along the first angular direction ( $k_t = k_s$ ), the optical beam including a second temporal address waveform substantially similar to the first temporal "address" waveform ("we reused . . . the original . . . signal beam") so as to cause the optical interference grating to produce, in response, an output optical pulse propagating along the second angular direction determined by the second programming pulse ("we examine the time-reversed diffracted beam along  $k_r$ ").

Art Unit: 2872

The examiner regards the matched filters of Weiner, et al as fairly constituting "address temporal waveforms encoded in the subgratings" since only the appropriately encoded playback pulse retrieves the desired result. To the extent that the trajectory ( $k_r$ ) of the "reference beam" determines the direction of the readout, the reference beam is fairly regarded as comprising a direction "programming" pulse.

With regard to claim 70, to the extent that it may be held that the nature of the active medium limits the method in a manipulative sense, then it is noted that the active medium is non-frequency selective.

With regard to claim 56 and its dependent claims, it is understood by those skilled in the art that the recited functionality of the subgratings flows from specific structural features of the subgratings. These recitations have been accorded patentable weight to the extent that the prior art must have a structure capable of such functionality. In this respect, the rejection relies upon the matched filters of the prior art (§ III.C), and the particular case of "angular multiplexing" of matched filters (atop Pg. 2257), wherein Weiner, et al disclose

an active material ("thermoplastic plate"); and

an ordered assemblage of subgratings supported by the active material

wherein

(1) the subgratings are to receive an input pulse (test signal) from an input path ( $k_t = k_s$ ) and to generate an output optical pulse along one of multiple angularly distinct output directions, if the input optical pulse includes an "address" temporal code substantially similar to one of a set of "address" temporal codes

Art Unit: 2872

encoded in the subgratings, each of the set of "address" temporal codes corresponding to one of the angularly distinct output directions ("each correlation would correspond to a different diffracted direction"),

(2) the subgratings are to transmit noise if the input optical pulse does not include a temporal waveform substantially similar to one of the set of address temporal codes (see discussion of Figures 6a – 6d beginning in the last paragraph of the left column on Pg. 2256), and

(3) the set of address temporal codes are each formable within the active material using address pulses as recited.

The recitation (4) of *the manner by which* the multiple angularly distinct output directions "are established" is not regarded as distinguishing over the prior art to Weiner, et al. It is well settled that process limitations cannot impart patentability to product claims, where the *structure* of the product is not distinct from the prior art. Although Weiner, et al *may* use direction pulses each incident along one of multiple angularly distinct output directions, or *may* use spectrally distinct direction pulses (it is thought), both methods lead to the same result: namely, a varying fringe period in the y-direction. Thus, the *structure* of the subgratings of Weiner, et al is believed to be identical to a *structure* formed in the recited manner.

With regard to claims 61 and 62, Weiner, et al disclose a preferred embodiment that employs a "thin holographic medium" (Pg. 2252, bottom of second column) in which Bragg angle selection is not required. Both amplitude and phase of the interfering beams is recorded (bottom of first column, Pg. 2252). Thus, it will be appreciated that

Art Unit: 2872

the preferred embodiment is one in which a surficial grating condition must be satisfied. However, one of ordinary skill would recognize the reference to "angular multiplexing" atop Page 2257 as a clear reference to Bragg angle selection in the hologram of a non-preferred embodiment.

With regard to claim 63 and its dependent claims, the system of Weiner, et al fairly constitutes a "communication system" within the specificity recited.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 56, 57, 59 – 64, 66, 67, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weiner, et al (*IEEE J. Quantum Elec.* 28(10)), in view of Kewitsch, et al (U.S. Patent number 5,422,873). As set forth above, Weiner, et al are believed to anticipate the method and claimed structure. However, to the extent that it *may be* held that the reference beam of Weiner, et al is does not comprise a "direction programming" pulse or that the multiply angularly distinct output directions must have been established using "direction pulses each incident on the active material along one of the multiple angularly distinct output directions", then the following applies.

In the field of holography, Kewitsch, et al disclose methods of multiplexing interference gratings within an active material. Kewitsch, et al teach that it is known to



Art Unit: 2872

multiplex a plurality of interference gratings (holograms) within the same volume of active material by directing reference beams into the medium at different angles (Col. 3, lines 15 – 30). Kewitsch, et al also teach that a plurality of holograms that have been stored by changing the spectrum of the reference beam (wavelength multiplexing) can also be read out at different angles (Col. 3, lines 45 – 52). Kewitsch, et al regard this scheme as a hybrid of the wavelength and angular multiplexing. Those skilled in the art would have recognized the disclosed functionality as flowing from the fact that both recording methods result in fringes that vary in period. In this respect, Kewitsch, et al fairly teach the equivalence of varying the fringe period by changing the spectrum of the reference beam and varying the fringe period by using direction programming beams each incident on the active material along one of a plurality of angularly distinct directions. Although in their *preferred* embodiment, Kewitsch, et al do not use angular multiplexing, they nonetheless disclose that angular multiplexing can be used (Col. 10, lines 1 – 6; actually, Kewitsch, et al teach that there is no single best embodiment: Col. 17, lines 61 - 65).

It would have been obvious to one of ordinary skill in the art to form the fringes of varying period in the apparatus of Wiener, et al by a method of directing direction programming pulses to the active material along a plurality of angularly distinct output directions, since Kewitsch, et al teach that this is equivalent to other methods of varying the fringe period, and does not require bulky and expensive tunable sources.

***Allowable Subject Matter***

Claim 44 is allowable over the prior art. Claim 68 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art, taken alone or in combination, fails to teach or to fairly suggest

the composite grating *in combination* with a router responsive to change the routing of data in response to an optical pulse having the prescribed detectable temporal waveform along the output path *from the composite grating*, as recited in claim 44; or

the method comprising the *combination* of steps particularly wherein the step of directing an optical beam to impinge upon the optical interference grating, is a step of directing an optical beam comprising a coded optical data stream convolved with the first temporal address waveform, as recited in claim 68.

Although J.A. Saleh, et al (*J. Lightwave Techn.* 8(3)) suggest convolving a coded optical data stream with spectral address information, the step is not suggested for use in combination with steps of programming an active material with an interference grating.

### ***Response to Amendment***

Applicants' cancellation of claims 27 – 42 and 52 – 55 renders the previous prior art rejections thereof moot.

Applicants appear to regard the disclosure of angular multiplexing in Weiner, et al as a prophetic example. However, Weiner, et al do not disclose that it "might be" possible to angularly multiple. Kewitsch, et al demonstrate that angular multiplexing of holograms was well within the level of ordinary skill. Thus, one of ordinary skill, would regard the remark that Weiner, et al "note the possibility" as a note that *it is possible*. Thus, Weiner, et al fairly disclose a non-preferred, non-illustrated embodiment of their invention.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Jenkins, et al (U.S. Patent number 5,121,231) disclose angular multiplexing of holograms and suggest their use in optical communications systems.

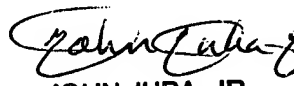
Art Unit: 2872

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Juba whose telephone number is (571) 272-2314. The examiner can normally be reached on Mon.-Fri. 9 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Drew Dunn can be reached on Mon.- Thu., 9 - 5.

The centralized fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for *all* communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
JOHN JUBA, JR.  
PRIMARY EXAMINER  
Art Unit 2872

April 2, 2004